

CAVITY DRAIN MEMBRANE SYSTEMS: SUMPS AND PUMPS – GUIDANCE NOTES

Introduction:

In most cases when installing the Isola Platon cavity drain system the actual level of water ingress or potential level of water ingress is not known. However in accordance with BS 8102 (1990) **it must be assumed that water will ingress at some point in time.**

1. Pump Capacity:

If the water ingress is known then the required minimum capacity of the sump and pump system can be easily calculated. The capacity of the sump pump is affected by a number of factors and these need to be taken into account when calculating the capacity of your pump system, these include:

- 1 Internal diameter of discharge pipe
- 2 Length of discharge pipe
- 3 Head height (including depth of sump chamber)
- 4 Number of bends/angles in discharge pipe
- 5 Stated capacity of pump

Each of the above **will** affect the capacity of the installed pump. All pumps have a stated maximum capacity and maximum stated head that they are able to pump to, manufacturers figures are given for a stated diameter of pipe. Therefore any variations of these and the pumps capacity will be changed.

2. Number Of Sumps:

The number of sumps required will again vary depending on the volume of water ingressing and or anticipated within the system, and the size of the floor area being covered as well as the type of drainage system incorporated into the design specification. In general there should be at least one sump per 50 sq m of floor area.

3. Type Of Sump:

The type of sump is also important, perforated sump chamber or non perforated sump chamber. In general either sump chamber may be suitable however where the following site conditions occur then **ONLY** the non perforated chamber should be installed:

- High water table
- High perched water table
- High silt/sediment content in groundwater
- Risk of de watering where structure maybe undermined

If there is any concern it is better to install a non perforated chamber or seek further technical assistance (contact Triton technical dept on: **020 8310 3929**).

For details of sump installation see section in this manual on Triton Aquasump installation.

4. Number Of Pumps:

If the level of water ingress is known then the required pump capacity can be calculated taking into account the length of discharge pipe, head height etc.. as indicated in section 1 above. Then it is a simple multiplication of the number of pumps to cope with the required level of ingress (plus a safety factor).The pumps capacity should be at least 2 to 3 times that which is currently required at time of installation.

E.G. If 100 l/min of water is ingressing then pump capacity should be 2-300 l/min, therefore if single pump capacity has been calculated to 50 l/min then four pumps to be included within the system.

As with all mechanical items they are prone to failure and require regular maintenance. Pump failure could either be from mechanical failure, power failure or lack of maintenance. It is for these reasons that it is best practice to install a **minimum of two pumps per sump chamber**. These can either be two 240v mains powered pumps or a mains powered pump and a battery back up pump. Therefore should one pump fail for what ever reason the second pump will take over. This is also true if the level of water ingress increases to such an extent that the first pump cannot cope the second pump will “kick in” to assist.

Thus reducing the risk of the basement flooding!

5. Maintenance:

As previously stated the sumps and pumps need to be maintained, **this should be carried out every six months.**

A typical pump, sump, and drainage schedule is included within this manual as a guide and is the **minimum maintenance required.**

It is important that if during a maintenance visit the level of water ingress has increased, and the capacity of the system is near optimum, then under the bounds of "DUTY OF CARE" the client should be advised that the system needs upgrading. This may include changing the pumps for those with a higher capacity, increasing the number of pumps, or increasing the number of sumps and pumps within the system.

As with the ongoing maintenance this is chargeable!



TRITON AQUA PUMP SYSTEM

DESCRIPTION AND USE

When installing Isola Platon Cavity Drainage membranes careful attention must be given to provide a suitable drainage solution. Natural drainage is not normally possible or convenient in below ground situations, so mechanical drainage must be used.

TRITON AQUA PUMP is a ready to use complete water control system principally designed for use in below ground structures to control water ingress. The system consists of a pre-formed polyethylene sump basin, a mains powered 230v submersible pump, a non-return valve assembly and a battery operated high water level alarm, which is linked to an integral float switch. The TRITON AQUA PUMP system can be linked to TRITON AQUA CHANNEL (see Triton Aqua Channel Data) to manage water ingress from retaining walls and in turn pumping out to a suitable drainage point.

IMPORTANT NOTE: The Triton Aqua Pump must only be used for pumping ground water. The pump should not be used to pump grey water from; sinks/washing machines/dishwashers/condensing boilers or effluent. Triton Chemical Manufacturing Ltd will not accept responsibility or liability for pump failure or damage caused due to the misuse of the pumping system.

COMPONENTS

SUMP BASIN – The Sump Basin is a polyethylene pre-formed chamber, measuring 560mm high x 540mm diameter (top) x 460mm diameter (base) and is most commonly located into the floor, finishing flush with the surrounding floor level. The Sump Basin is supplied with a structural foam flat lid, which can accept foot traffic. The lid can be easily removed to allow regular maintenance of the internal submersible pump or pumps.

SUBMERSIBLE PUMP – The pump is positioned within the Sump Basin and is controlled by an automatic snap-action float switch. As the water level increases within the sump the float rises and when the pre-set switch level is reached the pump will automatically operate and discharge the water. The Pump is 230v and requires wiring into an independent fused spur outlet within 1.5m of the pump.

PUMP SPECIFICATION

Discharge Bore	-	38.1mm
Max. Head	-	6m
Max. Capacity	-	220 litres/min @ 1m
Motor Output	-	1/3 Hp
Max. Width	-	214mm
Max. Height	-	258mm
Max Depth	-	270mm
Voltage	-	230v
Fuse rated	-	5.0amp

NON-RETURN VALVE ASSEMBLY – To avoid any discharged water backing-up into the sump basin, a non-return valve assembly is provided. This is fitted directly to the submersible pump outlet via flexible couplings and supplied ready to accept a standard 1½” waste pipe.

HIGH WATER LEVEL ALARM – The High Water Level Alarm is an essential component within the Aqua Pump system. In the event of mechanical failure of the pump or an unexpected power failure, the water will continue to fill the sump. When the water reaches the level of the alarm float switch, the 80db alarm will sound, giving warning of the failure. The alarm is powered by a 9v battery, which should be positioned in a convenient location such as a kitchen/lounge where it will be easily heard. Once the alarm is heard immediate action must be taken to avoid flooding. Additionally a 12v battery operated pump can be installed offering peace of mind to the client, while investigations are made into the failure. See Triton Battery Back-up Pump System data.

PREPARATION AND INSTALLATION

The site conditions or situation being encountered may well determine the positioning of the Triton Aqua Pump System. However, ideally it should be sighted at the lowest point of the room and or closest to the nearest point where water will be discharged. **The most important thing is to make sure that water can get to the pumping station.** Once the pump position has been established, dig a circular hole to a depth of 650mm and to a width of 650mm .

At the base of the walls of the sump basin, drill 4 holes opposite each other, (12mm dia), insert two lengths of reinforcing bar (660mm long) through drilled holes .These will add additional anchoring for the sump basin in the ground.

Fit the high water level alarm float switch sensor into the pre-cut hole provided within the wall of the sump basin and ensure that the (jaw) of the switch sensor is open and hangs downwards. Bring the two cables with bullet connectors attached back into the sump basin either through one of the holes provide or by drilling a hole and leave ready to be connected to the wires of the water alarm. **NB:** if the water discharge pipe from the pump is to be concealed below the floor, then a 1½” hole will need to be cut through the side of the basin. However, the position of this hole can only be determined once the sump basin has been offered into position, otherwise the discharge pipe can be taken through the lid of the basin.

Lay approx 100mm concrete at the base of the hole and insert the sump basin. Using a spirit level, adjust the top of the basin to the level of the finished floor level. Fill the basin two thirds with water, then infill around sump basin with concrete, ensuring it is well compacted. **NB:** If Platon membrane is being installed over the floor, then the concrete will need to be finished 100m lower than top of sump, drill a number of perforations to edge of sump basin and infill void above concrete with 20mm stone. (drwg no. IP029.1) However, when Platon membrane is not going to be installed over the floor, the concrete should finish flush with top of sump basin.

Insert the Aqua Pump in the base of the sump basin and connect the water discharge pipe to the flexible coupling already attached to the pump. The discharge end of the pipe can be taken through a wall and extended to a gully outlet at ground/street level. Alternatively, the discharge pipe can be connected straight into a soil pipe using a ‘boss’ connection. **Where a double pump installation is being used (Aqua Pump Plus), each pump must be wired into an independent fused spur outlet. One of the Aqua Pumps (the secondary pump) in the double pump kit will have been fitted with 25mm long spacers at the base of the pump so that this pump is raised off the bottom of the sump basin.**

Connect the wires from the float switch sensor to the wires of the water alarm using the bullet connectors provided. Then connect the pump/s power cable into a fused spur outlet (fuse rating 5amp) and test the pump and alarm for working order.

MAINTENANCE

It is recommended that the Triton Aqua Pump System is maintained /serviced at a minimum every six months. This should be carried out by a competent contractor (under a maintenance contract) or by the property owner. During a service all parts of the Aqua Pump kit should be checked to ensure fully operational. The sump should be cleared of any silt/sludge that may have accumulated to avoid potential damage to the pump/s.

The sump must be filled with water to ensure the automatic float switch and pump are fully operational. We recommend renewal of the 9v battery within the alarm and that the alarm float switch checked to ensure the alarm sounds. Any defective parts must be replaced /repaired to avoid failure of the system. Example of suitable sump, pump and drainage schedule can be found in the Isola manual, or downloaded from the Triton website www.triton-chemicals.com

We recommend records of each service be kept by the property owner.

For further information please contact:

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SUMP INSTALLATION:

Once the type of sump most suitable for the basement / project has been selected. It is important to ensure that the sump chamber is installed correctly.

1. PERFORATED SUMP CHAMBER:

Once the location for the sump has been identified:

- Dig a circular hole to a depth (minimum) of 610mm and to a width of (minimum) 630mm.
- Connect alarm and inlet and discharge pipes in accordance with instructions for Aquapump.
- Lay a 50mm bed of 20mm aggregate in the base of the hole.
- Insert sump basin.
- Using spirit level, adjust top of basin to level, and level with required height of finish e.g. finished floor.
- Fill in around the sides of the sump chamber with 20mm aggregate.
- Continue to install pumps and alarms in accordance with their installation guidelines.

2. NON PERFORATED (SOLID) SUMP CHAMBER:

Once the location for the sump has been identified:

- Dig a circular hole to a depth of 650mm (minimum) and to a width of 650mm (minimum).
- At the base of the sump chamber drill 4 number holes (minimum 12mm diameter) opposite to each other.
- Cut two lengths of reinforcing bar to 660mm (minimum) in length and insert into holes drilled into base of chamber. Each bar should protrude a minimum of 100mm from each side of the sump chamber.
- Connect alarm, inlet pipes and discharge pipes in accordance with Aquapump installation.
- Place 100mm concrete to base of hole
- Insert sump chamber to hole.
- Check that sump is level and set at required height by way of spirit level.
- Fill sump two thirds with water, then infill around chamber with concrete, ensuring it is well compacted.
- Once concrete has cured, empty sump of water and install pumps and alarms in accordance with their installation guidelines.

See drawing numbers IP 029.1 and IP 013.1 for details (in drawing section of this manual).



Aqua Pump and Aqua Channel Service Schedule

Property Address:

Job Ref:

Date of Inspection:

Contractor Name:

Aqua Channel	Checked by:	Further action required?
<input type="checkbox"/> Check for Debris
<input type="checkbox"/> Check Limescale/Silt
<input type="checkbox"/> Accumulation
<input type="checkbox"/> Check Jetting Eyes
<input type="checkbox"/> Flush out Channel
<input type="checkbox"/> Other

Aqua Pump	Checked by:	Further action required?
Minimum every 6 months		
<input type="checkbox"/> Clean silt/debris from sump
<input type="checkbox"/> Clean silt/debris from discharge pipes
<input type="checkbox"/> Check connections in discharge pipes
<input type="checkbox"/> Test discharge pipes
<input type="checkbox"/> Remove & inspect pump(s), wipe clean
<input type="checkbox"/> Check all pipe & electrical connections
<input type="checkbox"/> Test float mechanism, clean as required
<input type="checkbox"/> Check one way valve, clean & test
<input type="checkbox"/> Reinstate pump into sump & test
<input type="checkbox"/> Replace pump if/as required

continued overleaf.....

Battery Back-Up Pump System	Checked by:	Further action required?
Minimum every six months		
<input type="checkbox"/> Check all pipe & electrical connections, test
<input type="checkbox"/> Visually inspect & clean pump, isolate from mains pump & test, inc. pump float switch
<input type="checkbox"/> Check distilled water levels in battery, top up if necessary

High Level Alarm	Checked by:	Further action required?
Minimum every 6 months		
<input type="checkbox"/> Replace 9V battery, check float switch, test to ensure alarm sounds

Full System Testing	Checked by:	Further action required?
On completion of the above steps, flood test whole system		
<input type="checkbox"/> Aqua Channel
<input type="checkbox"/> Pumps & Back Up Pumps
<input type="checkbox"/> High Level Alarm

Further Inspections		
Next inspection recommended in:	Contractor's signature:	Client's signature:
<input type="checkbox"/> 3 months		
<input type="checkbox"/> 6 months		
<input type="checkbox"/> 12 months		

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TRITON AQUACHANNEL

DESCRIPTION & USE

TRITON AQUACHANNEL is a P.V.C drainage conduit designed for the control of water ingress in below ground situations.

TRITON AQUACHANNEL is fitted around the perimeter of the floor at the vulnerable wall/floor junction.

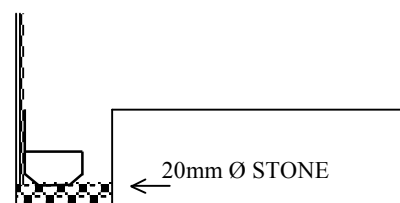
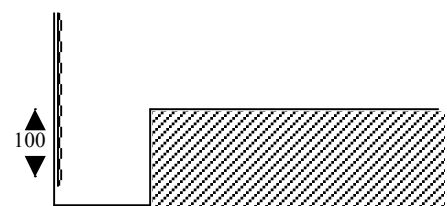
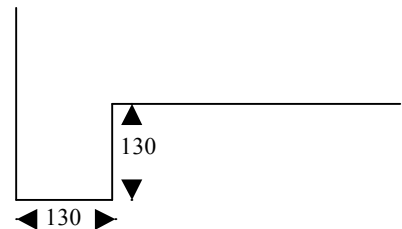
TRITON AQUACHANNEL can be used in most waterproofing situations, and is particularly suited for use in conjunction with Isola Platon Cavity Drain Membrane systems. Water entering the building through the walls is controlled behind the Platon Membrane and diverted to the Aquachannel at the base of the wall. The water enters the Aquachannel through pre-drilled drainage holes and must then be diverted to a suitable drainage point, either natural or a sump and mechanical pump (see Triton Aqua Pump).

In situations where an existing floor slab/screed is solid and showing no signs of water ingress, cracking or de-bonding, the installation of Aquachannel can eliminate the need for Platon Cavity Drain membrane on the floor, proving beneficial in areas of limited headroom.

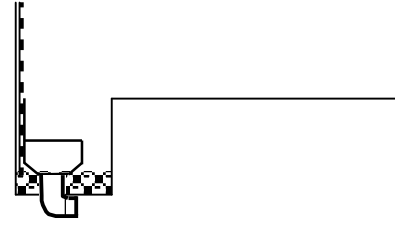
The application of a liquid waterproof coating to the existing floor would be recommended to act as a moisture suppressant.

INSTALLATION

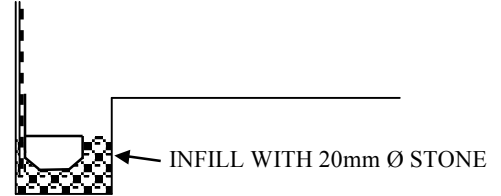
1. Form a trough 130mm deep x 130mm wide in the floor at the wall/floor junction.
2. Apply the waterproof coating or System Platon Cavity Drain Membrane to the wall and finish 100mm minimum below existing floor level.
3. Lay a shallow bed of 20mm stone into the trough. Place the Triton Aquachannel onto the stone with the upstand to the top and flat against the waterproofing/cavity drain membrane to the wall. Lengths of Aquachannel are butt jointed on straight runs and can be mitred in corners. Joints should be sealed with a suitable tape, Platon over tape or builder duck tape, to avoid debris from falling into the channel



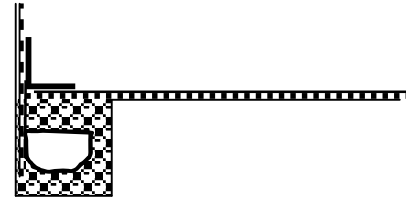
4. Fit the Aquachannel outlet into the Aquachannel at the appropriate location. The Aquachannel outlet requires a 40mm hole in the underside of the Aquachannel. The Aquachannel outlet is solvent welded to the channel using the internal male coupling. A chase should be formed into the floor to accommodate the outlet pipe from the Aquachannel to the sump or drain.



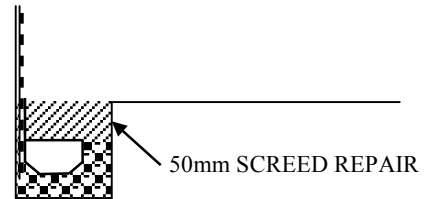
5. Infill the remaining gap between the Aquachannel and the side of the trough with 20mm stone and finish flush with the flat surface of the Aquachannel.



6. When installing Platon membrane over the floor, make good the remaining area with 20mm stone. Lay the membrane over the floor area and seal to the wall membrane using Platon wall/floor junction or Platon Sealing rope.



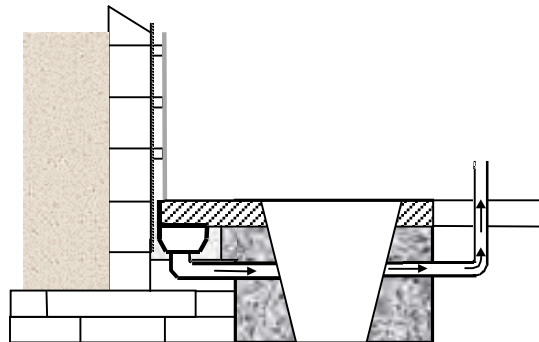
7. When Platon membrane is not going to be installed over the floor, make good the remaining area with approximately 50mm screed.



MAINTENANCE

It is recommended that the Triton Aqua channel be jet washed via the jetting ports, which should be incorporated in the channel system, at least once every six months. This should be carried out by the installing contractor (under a maintenance contract) or by the property owner. During this cleaning process the pump/s (if installed) should also be run with water out of the sump chamber to ensure they are fully operational and that the sump chamber be cleaned of any sludge/silt that may have accumulated. In addition to this, the high water level battery alarm box and alarm sensor should also be checked for working order.

TYPICAL INSTALLATION



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Ref : 12/01 DATA. TRITON AQUACHANNEL



TRITON BATTERY BACK-UP PUMP SYSTEM

DESCRIPTION & USE

The TRITON BATTERY BACK-UP PUMP SYSTEM is a 12-volt battery operated pump system designed for use in conjunction with the Triton Aqua Pump kit. Its unique design gives the client peace of mind knowing that their water pumping system can remain operational and their basement can remain dry, even in the event of a mechanical breakdown of the primary pump or a temporary power failure.

The battery back-up system consists of a 12-volt battery, a 12-volt pump, a battery trickle charger, float switch and a compact waterproof housing. All electrical and mechanical parts are located within the housing, which is sited away from the sump chamber; this ensures no contamination from water.

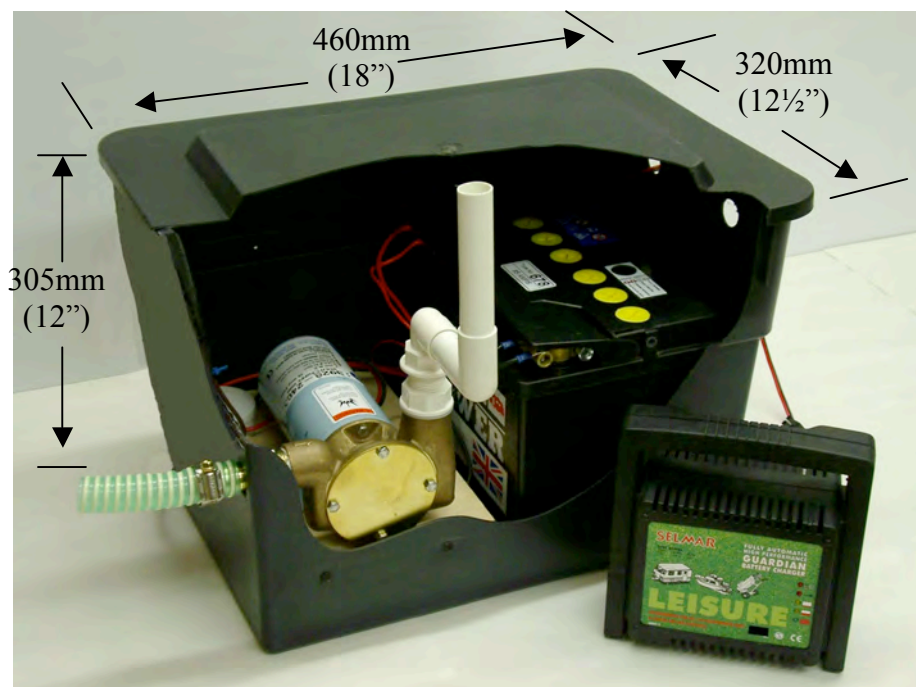
The pump, which is located within the housing, is connected to the sump chamber by a suction hose. The pump operates when the float switch, in the sump chamber, is engaged. The pump draws the water from the sump through the pump and to a suitable drainage point.

The 240v trickle charger maintains the charge in the battery whilst the mains power is live. In the event of a power failure the charge held within the battery will operate the pump. When the power is reinstated the trickle charger will boost the battery back-up to full charge.

During a power failure the expected continual running time of the 12v pump with a fully charged battery would be approximately 6.0 hours, but most commonly the pump would run intermittently for 1 minute at a time. Therefore greatly extending the functional life.

The 12v pump has a maximum output of 1920 Lph and can operate in excess of a 6m vertical head.

IMPORTANT NOTE: The Triton Aqua Pump must only be used for pumping ground water. The pump should not be used to pump grey water from; sinks/washing machines/dishwashers/condensing boilers or effluent. Triton Chemical Manufacturing Ltd will not accept responsibility or liability for pump failure or damage caused due to the misuse of the pumping system.



TRITON BATTERY BACK-UP PUMP INSTALLATION

Position the Battery Back-up Pump kit in the desired location. **NB** the flexible suction hose should not be extended greater than 1.8m from the base of the sump chamber.

Run the flexible suction hose from the sump chamber (allowing approximately 50mm of hose off the base of the sump) and secure the hose to the side of the chamber with the clips provided.

Connect the outer end of the flexible suction hose to the pump inlet with the jubilee clip provided and secure tight.

The battery pumps float switch is secured within the chamber to the vertical discharge pipe that extends from the primary pump, with a clamping bracket. **This will normally be pre-fixed in place around a section of vertical discharge pipe when delivered with a primary pump i.e. the Aqua pump kit or Aqua Pump Plus Kit.** If it is found that the float switch and clamping bracket are not pre-fixed around a section of vertical discharge pipe, then the float switch and clamping bracket must be fitted, positioned and adjusted so as to ensure there is free movement of the float switch in the sump chamber, the float in the relax off position should measure 14cm from bottom of the float to the base of the sump basin.

Connect the battery pump float switch cable/wire to the connector block located inside the back-up pump housing.

Solvent weld the discharge pipe to the pump outlet and connect this water discharge pipe to a suitable drainage point: - Drainage Gulley, Stack pipe using a 'Boss Connector' or T-Connector.

Connect each battery cable to the correct battery terminal and tighten the connector bolts and then plug-in the battery charger to the power supply. The battery will begin to charge.

The battery charge state is indicated by the L.E.D display on the charger. Once the battery is charged, fill the sump chamber with water and test the battery back-up system several times to ensure it is fully operational.

MAINTENANCE

It is recommended that the Triton Battery Back up system is maintained/serviced at a minimum every six months. This should be carried out by a competent contractor (under a maintenance contract) or by the property owner. During this service the principle pump/s should be temporarily isolated then the battery back-up pump float switch should be tested and checked it is working properly. The sump chamber should be filled with water and the battery back-up pump should be run so that the water is discharged from the sump chamber, which ensures that the pump is fully operational.

The distilled water levels within the battery should be checked and topped up as necessary to ensure the cells do not run dry. Any defective parts must be replaced/repaired to avoid failure of the system.

We recommend records of each service be kept by the property owner.

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